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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,199	02/26/2004	Wilhelm Stein	5367-83	6966

7590 07/22/2005

COHEN, PONTANI, LIEBERMAN & PAVANE
Suite 1210
551 Fifth Avenue
New York, NY 10176

EXAMINER

LOUIE, WAI SING

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/789,199	STEIN ET AL.	
	Examiner	Art Unit	
	Wai-Sing Louie	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 24-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9, 10, 12, 15, 16, 20 and 31 is/are rejected.
- 7) ☒ Claim(s) 6-8, 11, 13, 14, 17-19, 21-23 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's election without traverse of Group I, claims 1-23 and 31-32, in the reply filed on 5/12/05, is acknowledged. It is suggested that non-elected claims be canceled in the response to this Office Action.

Claim Objections

Claims 1-23 are objected as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In claim 1, "a layer sequence of a barrier layer and a coupling layer over the protective layer and a solder layer" is claimed. However, fig 1 clearly shows the solder layer is over the wetting layer, coupling layer, barrier layer, and the protective layer. For the purpose of examination, the sequence of layers of fig. 1 will be assumed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-5, 9-10, 12, 15-16, 20, and 31 (in so far as they are understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Burkhart et al. (US 4,210,389) in view of Butterbach et al. (US 6,228,456).

With regard to claims 1, 10, and 31 Burkhart et al. disclose a solid-state laser rod (col. 2, line 54 to col. 6, line 49 and fig. 3) comprising:

- A reflector (mirror) 20 of metal adapted to be formed over the semiconductor laser rod 6 (col. 4, lines 12-21 and fig. 3);
- A barrier layer 22 over the protective layer and the reflector layer 20 (col. 3, lines 32-34 and fig. 3);
- A solder layer 26 over the barrier layer 22 (col. 3, lines 32-34 and fig. 3);
- Burkhart et al. do not disclose a protective layer over the reflector layer 20.

However, Butterbach et al. disclose an adhesive (protective) layer 5 over a metallic reflection layer 4 (Butterbach col. 4, lines 30-45 and fig. 1-2). Butterbach et al. teach that the adhesive layer protects the metal reflector against corrosion (Butterbach col. 3, lines 1-9). Therefore, it would have been obvious to one of ordinary skill in the art to modify Burkhart's device with the teaching of Butterbach et al. to provide a protective layer in order to protect the metal reflector against corrosion.

- Burkhart et al. modified by Butterbach et al. would have a protective layer. Since the protective layer is an adhesive layer, and, therefore, the protective layer could also be the coupling layer.

With regard to claim 2, Burkhart et al. modified by Butterbach et al. disclose a wetting layer 24 between the coupling (protective) layer and the solder layer 26 (fig. 3).

With regard to claim 4, Burkhart et al. disclose the mirror layer 20 contains silver or aluminum (col. 4, lines 60-61).

With regard to claim 5, Burkhart et al. disclose the thickness of the mirror layer is 100 nm (col. 4, lines 20-21).

With regard to claim 9, Burkhart et al. modified by Butterbach et al. disclose the protective layer is 30 μm thick (Butterbach col. 4, line 47), but do not disclose the layer is between 5 and 15 nm thick. Since the applicant has not established the criticality of the thickness stated and since these thicknesses are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device. Where patentability is said to be based upon particular chosen dimension or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

With regard to claim 12, Burkhart et al. disclose the barrier layer 22 is 3500 Å thick (col. 5, line 20).

With regard to claims 15-16, Burkhart et al. disclose the wetting layer 24 contains platinum (col. 5, line 44) and the thickness is 50-100 nm (col. 5, lines 40-41).

With regard to claim 20, Burkhart et al. disclose the material of the solder layer being suitable for forming alloy with the material of the carrier body (col. 6, lines 18-27).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burkhart et al. (US 4,210,389) modified by Butterbach et al. (US 6,228,456) as applied to claim 1 above, and further in view of Liu (US 6,806,544).

With regard to claim 3, Burkhart et al. disclose the light source is a laser rod 6, but do not disclose having a nitride compound semiconductor material. However, nitride compound semiconductor material is a common material for laser diode such as disclosed in Liu (Liu col. 8, line 48). Liu teaches the GaN laser diode could be driven with higher current and yield brighter output (Liu col. 1, lines 37-39). Liu's device comprises a laser rod 53 (Liu col. 7, line 19). Therefore, it would have been obvious to one of ordinary skill in the art to modify Burkhart's device with the teaching of Butterbach and Liu to provide a GaN laser diode to generate a laser beam through the laser rod in order to yield brighter output.

Allowable Subject Matter

Claim 6-8, 11, 13-14, 17-19, 21-23, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or suggest either in singularly or in combination the following limitations and other elements in the claims:

References Burkhart et al. modified by Butterbach et al. and Liu do not disclose:

- A layer of electrically conductive material between the semiconductor chip and the mirror to improve the adhesion of the mirror layer.
- The layer contains Point, Photodiode or Ni.
- The coupling layer contains titanium and the thickness is between 30-70 nm.
- A gold layer is applied to the solder layer and the thickness is approximately 30-70 nm.
- The solder layer contains AuGe, AuSi, palladium, or nickel oxide.
- The alloy is a eutectic alloy.

Therefore, the above references do not disclose the claimed invention of present application and claims 6-8, 11, 13-14, 17-19, 21-23, and 32 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

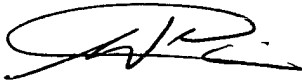
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wsl

July 15, 2005

A handwritten signature in black ink, appearing to be 'Wsl', written over a horizontal line.